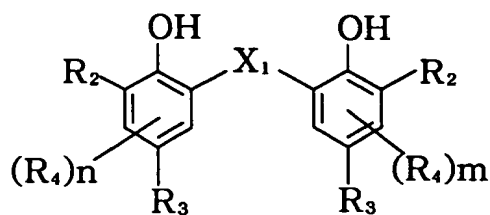


What is claimed is:

1. A photothermographic imaging material comprising an organic silver salt, a binder, a reducing agent, coupler and a main developing agent which forms coloring images by reacting with the coupler, those which are on a support, wherein:

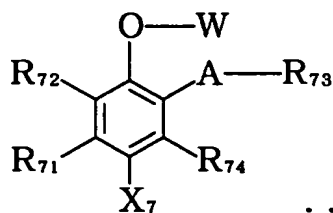
the reducing agent comprises a compound represented by the following Formula (1), the coupler is a compound represented by the following Formula (CP1) and sum of maximum density of colorant images at maximum absorption wavelength formed by the coupler and the main developing agent is 0.01 or more and 0.50 or less;



... Formula (1)

wherein the  $X_1$  represents chalcogen atom or  $-CHR_1-$  (the  $R_1$  represents hydrogen, halogen, alkyl group, alkenyl group, aryl group or heterocyclic group) and the  $R_2$  represents alkyl group, the two  $R_2$ s can be either same or different, and at least one of them is secondary or tertiary alkyl group, the  $R_3$  represents hydrogen atom or a group which can be a substituent on a benzene ring, the  $R_4$  represents a group which can be a substituent on a benzene ring, the  $m$  and the  $n$  represent integer of 0 to 2

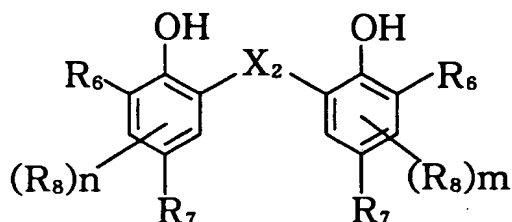
respectively; and



...Formula (CP1)

wherein the R<sub>71</sub> is hydrogen atom, halogen atom, substituted or unsubstituted alkyl, alkoxy and -NHCO-R group (the R represents an alkyl, aryl or heterocyclic group), the A represents -NHCO-, -CONH- or -NHCONH- group, and the R<sub>73</sub> represents a substituted or unsubstituted alkyl, aryl or heterocyclic group, and the -A-R<sub>73</sub> may be a hydrogen atom, the W represents a hydrogen atom or -CONH-R<sub>75</sub>, -CO-R<sub>75</sub> or -CO-O-R<sub>75</sub> group (the R<sub>75</sub> represents a substituted or unsubstituted alkyl, aryl or heterocyclic group.), and the R<sub>72</sub> and the R<sub>74</sub> represent hydrogen atoms, halogen atom, a substituted or unsubstituted alkyl, alkenyl, alkoxy, carbamoyl or nitrile groups, and the X<sub>7</sub> represents a hydrogen atom or a group which can be eliminated by oxidation coupling reaction with main developing agent.

2. The material of claim 1, wherein the reducing agent further comprises a compound represented by the following Formula (2); and

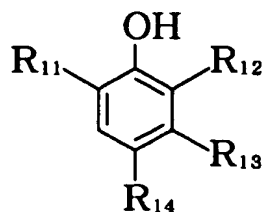


... Formula (2)

wherein the  $X_2$  represents chalcogen atom or  $-CHR_5-$  (the  $R_5$  represents hydrogen, halogen, alkyl group, alkenyl group, aryl group or heterocyclic group) and the  $R_6$  represents alkyl group. The two  $R_6$ s can be either same or different, but are not secondary or tertiary alkyl group, the  $R_7$  represents hydrogen atom or a group which can be a substituent on a benzene ring,  $R_8$  represents a group which can be a substituent on a benzene ring, and the  $m$  and the  $n$  represent integer of 0 to 2 respectively.

3. The material of claim 2, wherein mass ratio between the compound represented by the Formula (1) and the compound represented by the Formula (2) is 5:95 to 45:55.

4. The material of claim 1, further comprising a compound represented by the following Formula (YA) in a side of a face having an image forming layer; and



... Formula (YA)

wherein the R<sub>11</sub> represents a substituted or unsubstituted alkyl group, the R<sub>12</sub> represents hydrogen atom or substituted or unsubstituted alkyl or acylamino groups, the R<sub>11</sub> and the R<sub>12</sub> are not 2-hydroxyphenylmethyl group, the R<sub>13</sub> represents hydrogen atom or substituted or unsubstituted alkyl group, and the R<sub>14</sub> represents a group capable of being substituent on a benzene ring.

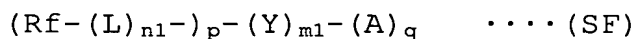
5. The material of claim 1, wherein an image obtained by thermal development in developing temperature at 123°C and developing time for 13.5 seconds has an average gradation of 2.0 to 4.0 at an optical density under diffused light in a range of 0.25 to 2.5 on a characteristic curve shown on rectangular coordinates where Y axis is diffuse density and X axis is common logarithm exposure amount and unit lengths of the X axis and the Y axis are equal.

6. The material of claim 1, comprising at least one silver saving agent selected from a vinyl compound, a

hydrazine derivative, a silane compound and a quaternary onium salt in a side of a face having an image forming layer.

7. The material of claim 1, wherein the binder has a glass transition temperature ( $T_g$ ) of 70 to 150 °C.

8. The material of claim 1, further comprising a compound represented by the following formula (SF); and



wherein the Rf represents a substituent having fluorine atom, the L represents a bivalent linkage group containing no fluorine atom, the Y represents a linkage group having (p + q) valency, and the A represents an anion group or an anion salt group. The  $m_1$  and the  $n_1$  represent an integer of 0 or 1 respectively, the p and the q represent an integer of 1 to 3 respectively, and when the q is 1, at least one of the  $n_1$  and the  $m_1$  is not 0.

9. The material of claim 1, wherein the silver halide comprises silver halide particles having a mean particle size of 10 to 50 nm.

10. The material of claim 9, wherein the silver

halide further comprises silver halide particles having the mean particle size of 55 to 100nm.

11. The material of claim 1, wherein the silver halide comprises silver halide particles which are chemically sensitized by a chalcogen compound.

12. The material of claim 1, wherein an content of silver in an image forming layer is from 0.3 to 1.5 g/m<sup>2</sup>.

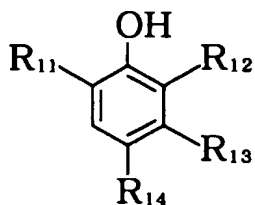
13. The material of claim 1, wherein a value of  $R_z(E)/R_z(B)$  is 0.1 or more and 0.7 or less where average roughness of 10 points at outermost surface at a side of an image forming layer with interleaving the support is rendered the  $R_z(E)$  and the average roughness of 10 points at outermost surface at an opposite side of the image forming layer with interleaving the support is rendered the  $R_z(B)$ .

14. The material of claim 1, wherein a value of  $L_b/L_e$  is 2.0 or more and 10 or less where mean particle size of a matting agent having maximum mean particle size contained a layer at an opposite side of an image forming layer with interleaving the support is rendered the  $L_e$  ( $\mu\text{m}$ ) and the mean particle size of matting agent having the maximum mean particle size contained in an opposite layer

at the side of the image forming layer with interleaving the support is rendered the Lb ( $\mu\text{m}$ ).

15. A photothermographic imaging material comprising an organic silver salt, a binder, a reducing agent, coupler, a main developing agent which forms coloring images by reacting with the coupler, and a compound represented by the following Formula (YA) those which are on a support wherein

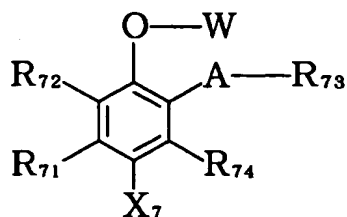
sum of maximum density of a colorant images at maximum absorption wavelength formed by the coupler and the main developing agent is 0.01 or more and 0.50 or less; and



... Formula (YA)

wherein the  $R_{11}$  represents a substituted or unsubstituted alkyl group, the  $R_{12}$  represents hydrogen atom or substituted or unsubstituted alkyl or acylamino groups, the  $R_{11}$  and the  $R_{12}$  are not 2-hydroxyphenylmethyl group, the  $R_{13}$  represents hydrogen atom or substituted or unsubstituted alkyl group, and the  $R_{14}$  represents a group capable of being substituent on a benzene ring.

16. The material of claim 15, wherein the coupler is a compound represented by the following formula (CP2); and



... Formula (CP2)

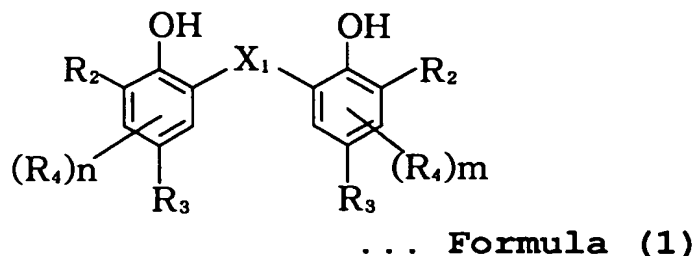
Wherein the R<sub>71</sub> and the R<sub>72</sub> are hydrogen atoms, halogen atoms, substituted or unsubstituted alkyl, alkenyl, alkoxy and -NHCO-R groups (the R represents an alkyl, aryl or heterocyclic group), or the R<sub>71</sub> and the R<sub>72</sub> are the groups which are bound one another to form an aliphatic hydrocarbon ring, aromatic hydrocarbon ring or heterocycle, the A represents -NHCO-, -CONH- or -NHCONH- group, and the R<sub>73</sub> represents a substituted or unsubstituted alkyl, aryl or heterocyclic group, the -A-R<sub>73</sub> may be a hydrogen atom, the W represents a hydrogen atom or -CONH-R<sub>75</sub>, -CO-R<sub>75</sub> or -CO-O-R<sub>75</sub> group (the R<sub>75</sub> represents a substituted or unsubstituted alkyl, aryl or heterocyclic group

.), and the R<sub>74</sub> represents a hydrogen atom, halogen atom, a substituted or unsubstituted alkyl, alkoxy, carbamoyl or nitrile group, and the X<sub>7</sub> represents a hydrogen atom or a group which can be eliminated by oxidation coupling reaction with main developing agent.

17. The material of claim 15, wherein the reducing



agent comprises a compound represented by the following Formula (1); and



wherein the  $X_1$  represents chalcogen atom or  $-CHR_1-$  (the  $R_1$  represents hydrogen, halogen, alkyl group, alkenyl group, aryl group or heterocyclic group) and the  $R_2$  represents alkyl group, the two  $R_2$ s can be either same or different, and at least one of them is secondary or tertiary alkyl group, the  $R_3$  represents hydrogen atom or a group which can be a substituent on a benzene ring, the  $R_4$  represents a group which can be a substituent on a benzene ring, the  $m$  and the  $n$  represent integer of 0 to 2 respectively.

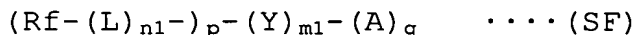
18. The material of claim 15, wherein an image obtained by thermal development in developing temperature at 123°C and developing time for 13.5 seconds has an average gradation of 2.0 to 4.0 at an optical density under diffused light in a range of 0.25 to 2.5 on a characteristic curve shown on rectangular coordinates where Y axis is diffuse density and X axis is common logarithm exposure amount and unit lengths of the X axis and the Y

axis are equal.

19. The material of claim 15, comprising at least one silver saving agent selected from a vinyl compound, a hydrazine derivative, a silane compound and a quaternary onium salt in a side of a face having an image forming layer.

20. The material of claim 15, wherein the binder has a glass transition temperature (T<sub>g</sub>) of 70 to 150 °C.

21. The material of claim 15, further comprising a compound represented by the following Formula (SF); and



wherein the Rf represents a substituent having fluorine atom, the L represents a bivalent linkage group containing no fluorine atom, the Y represents a linkage group having (p + q) valency, and the A represents an anion group or an anion salt group. The m<sub>1</sub> and the n<sub>1</sub> represent an integer of 0 or 1 respectively, the p and the q represent an integer of 1 to 3 respectively, and when the q is 1, at least one of the n<sub>1</sub> and the m<sub>1</sub> is not 0.

22. The material of claim 15, wherein the silver

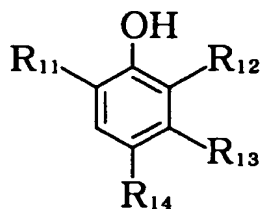
halide comprises silver halide particles having a mean particle size of 10 to 50 nm.

23. The material of claim 23, wherein the silver halide further comprises silver halide particles having the mean particle size of 55 to 100nm.

24. The material of claim 15, wherein the silver halide comprises silver halide particles which are chemically sensitized by a chalcogen compound.

25. The material of claim 15, wherein a content of silver in an image forming layer is from 0.3 to 1.5 g/m<sup>2</sup>.

26. A photothermographic imaging material comprising a organic silver salt, a silver halide, a binder, a reducing agent, a cyan leuco dye and a compound represented by the following general formula (YA); and

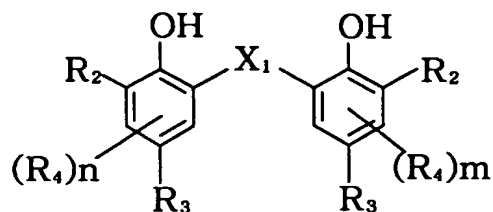


... Formula (YA)

wherein the R<sub>11</sub> represents a substituted or

unsubstituted alkyl group, the  $R_{12}$  represents hydrogen atom or substituted or unsubstituted alkyl or acylamino groups, the  $R_{11}$  and the  $R_{12}$  are not 2-hydroxyphenylmethyl group, the  $R_{13}$  represents hydrogen atom or substituted or unsubstituted alkyl group, and the  $R_{14}$  represents a group capable of being substituent on a benzene ring.

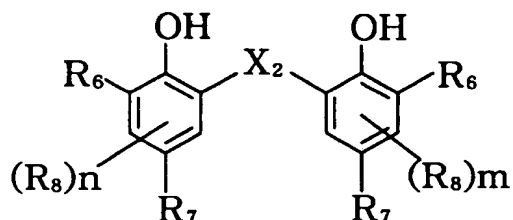
27. The material of claim 26, wherein the reducing agent comprises a compound represented by the following Formula (1); and



... Formula (1)

wherein the  $X_1$  represents chalcogen atom or  $-CHR_1-$  (the  $R_1$  represents hydrogen, halogen, alkyl group, alkenyl group, aryl group or heterocyclic group) and the  $R_2$  represents alkyl group, the two  $R_2$ s can be either same or different, and at least one of them is secondary or tertiary alkyl group, the  $R_3$  represents hydrogen atom or a group which can be a substituent on a benzene ring, the  $R_4$  represents a group which can be a substituent on a benzene ring, the  $m$  and the  $n$  represent integer of 0 to 2 respectively.

28. The material of claim 27, wherein the reducing agent further comprises a compound represented by the following Formula (2); and



... Formula (2)

wherein the  $X_2$  represents chalcogen atom or  $-CHR_5-$  (the  $R_5$  represents hydrogen, halogen, alkyl group, alkenyl group, aryl group or heterocyclic group) and the  $R_6$  represents alkyl group. The two  $R_6$ s can be either same or different, but are not secondary or tertiary alkyl group, the  $R_7$  represents hydrogen atom or a group which can be a substituent on a benzene ring,  $R_8$  represents a group which can be a substituent on a benzene ring, and the  $m$  and the  $n$  represent integer of 0 to 2 respectively.

29. The material of claim 28, wherein mass ratio between the compound represented by the Formula (1) and the compound represented by the Formula (2) is 5:95 to 45:55.

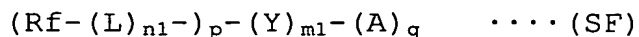
30. The material of claim 26, wherein an image obtained by thermal development in developing temperature at  $123^\circ\text{C}$  and developing time for 13.5 seconds has an

average gradation of 2.0 to 4.0 at an optical density under diffused light in a range of 0.25 to 2.5 on a characteristic curve shown on rectangular coordinates where Y axis is diffuse density and X axis is common logarithm exposure amount and unit lengths of the X axis and the Y axis are equal.

31. The material of claim 26, comprising at least one silver saving agent selected from a vinyl compound, a hydrazine derivative, a silane compound and a quaternary onium salt in a side of a face having an image forming layer.

32. The material of claim 26, wherein the binder has a glass transition temperature (T<sub>g</sub>) of 70 to 150 °C.

33. The material of claim 26, further comprising a compound represented by the following Formula (SF); and



wherein the Rf represents a substituent having fluorine atom, the L represents a bivalent linkage group containing no fluorine atom, the Y represents a linkage group having (p + q) valency, and the A represents an anion group or an anion salt group. The m<sub>1</sub> and the n<sub>1</sub> represent

an integer of 0 or 1 respectively, the p and the q represent an integer of 1 to 3 respectively, and when the q is 1, at least one of the  $n_1$  and the  $m_1$  is not 0.

34. The material of claim 26, wherein the silver halide comprises silver halide particles having a mean particle size of 10 to 50 nm.

35. The material of claim 34, wherein the silver halide further comprises silver halide particles having the mean particle size of 55 to 100nm.

36. The material of claim 26, wherein the silver halide comprises silver halide particles which are chemically sensitized by a chalcogen compound.

37. The material of claim 26, wherein a content of silver in an image forming layer is from 0.3 to 1.5 g/m<sup>2</sup>.